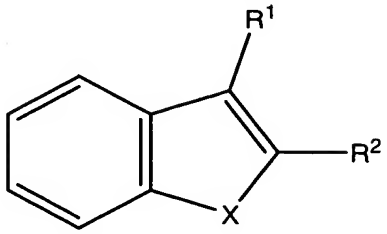
WHAT IS CLAIMED IS:

1. A compound comprising the formula



wherein X is selected from a group that comprises at least one of oxygen, nitrogen and sulfur; R^1 is selected from the group consisting of substituted or unsubstituted alkyl hydroxy, amide, urea, and urethane; and R^2 is selected from the group consisting of halogen and a hydrocarbon radical, wherein said hydrocarbon radical is selected from the group consisting of a C_1-C_{32} substituted or unsubstituted branched or straight chain alkyl, cycloaliphatic, aryl and heteroaryl, including five membered rings, six membered rings, and fused systems thereof.

2. The compound according to claim 1, wherein R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

3. The compound of claim 1, wherein X is oxygen, R^1 is alkyl hydroxy, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

4. The compound of claim 1, wherein X is oxygen, R^1 is an amide, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

5. The compound of claim 1, wherein X is oxygen, R^1 is urea, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

6. The compound of claim 1, wherein X is oxygen, R^1 a urethane, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

7. The compound of claim 1, selected from the group consisting of structures 1b to 65b.

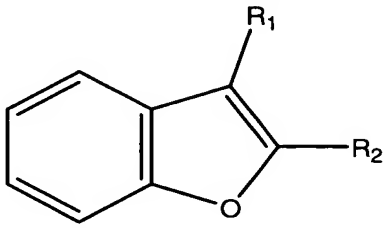
8. The compound of claim 1, further comprising a label selected from the group consisting of radioisotopes, paramagnetic particles and optical particles.

9. The compound of claim 8, wherein the label is a radioisotope selected from the group consisting of ^{3}H, ^{11}C, ^{14}C, ^{18}F, ^{32}P, ^{35}S, ^{123}I, ^{125}I, ^{131}I, ^{51}Cr, ^{36}CI, ^{57}Co, ^{59}Fe, ^{75}Se and ^{152}Eu.

10. The compound of claim 8, wherein the label is a paramagnetic particle selected from the group consisting of ^{157}Gd, ^{55}Mn, ^{162}Dy, ^{52}Cr, and ^{56}Fe.

11. The compound of claim 8, wherein the label is an optical particle selected from the group consisting of fluorophores and chemiluminescent entities.

12. A compound comprising the formula



wherein R^1 is selected from the group consisting of substituted or unsubstituted alkyl hydroxy, amide, urea, and urethane and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

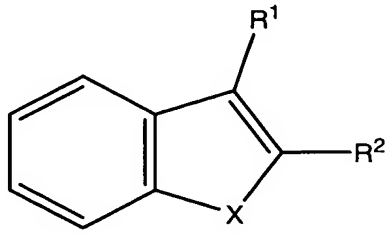
13. The compound of claim 12, further comprising a label selected from the group consisting of radioisotopes, paramagnetic particles and optical particles.

14. The compound of claim 13, wherein the label is a radioisotope selected from the group consisting of ^{3}H, ^{11}C, ^{14}C, ^{18}F, ^{32}P, ^{35}S, ^{123}I, ^{125}I, ^{131}I, ^{51}Cr, ^{36}CI, ^{57}Co, ^{59}Fe, ^{75}Se and ^{152}Eu.

15. The compound of claim 13, wherein the label is a paramagnetic particle selected from the group consisting of ^{157}Gd, ^{55}Mn, ^{162}Dy, ^{52}Cr, and ^{56}Fe.

16. The compound of claim 13, wherein the label is an optical particle selected from the group consisting of fluorophores and chemiluminescent entities.

17. An imaging agent comprising a compound having the formula



wherein X is selected from a group that comprises at least one of oxygen, nitrogen and sulfur; R^1 is selected from the group consisting of substituted or unsubstituted alkyl hydroxy, amide, urea, and urethane; and R^2 is selected from the group consisting of halogen and a hydrocarbon radical, wherein said hydrocarbon radical is selected from the group consisting of C_1-C_{32} substituted or unsubstituted branched or straight chain alkyl, cycloaliphatic, aryl and heteroaryl, including five membered rings, six membered rings, and fused systems thereof; and wherein said compound comprises a label selected from the group consisting of radioisotopes, paramagnetic particles and optical particles.

18. An imaging agent according to claim 17, wherein R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

19. An imaging agent according to claim 17, wherein X is oxygen, R^1 is alkyl hydroxy, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

20. An imaging agent according to claim 17, wherein X is oxygen, R^1 is an amide, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

21. An imaging agent according to claim 17, wherein X is oxygen, R^1 is urea, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

22. An imaging agent according to claim 17, wherein X is oxygen, R^1 a urethane, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

23. An imaging agent according to claim 17, selected from the group consisting of structures 1b to 65b.

24. An imaging agent according to claim 17, wherein the label is a radioisotope selected from the group consisting of ^{3}H, ^{11}C, ^{14}C, ^{18}F, ^{32}P, ^{35}S, ^{123}I, ^{125}I, ^{131}I, ^{51}Cr, ^{36}Cl, ^{57}Co, ^{59}Fe, ^{75}Se and ^{152}Eu.

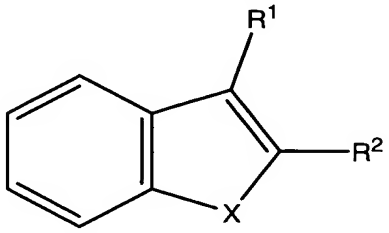
25. An imaging agent according to claim 17, wherein the label is a paramagnetic particle selected from the group consisting of ^{157}Gd, ^{55}Mn, ^{162}Dy, ^{52}Cr, and ^{56}Fe.

26. An imaging agent according to claim 17, wherein the label is an optical particle selected from the group consisting of fluorophores and chemiluminescent entities.

27. A method of detecting at least one of A-beta species and amyloidogenic peptides comprising the steps of

providing a sample suspected of comprising at least one of A-beta species and amyloidogenic peptides;

applying an imaging agent comprising a compound having the formula



wherein X is selected from the group that comprises at least one of oxygen, nitrogen and sulfur; R^1 is selected from the group consisting of substituted or unsubstituted alkyl hydroxy, amide, urea, and urethane; and R^2 is selected from the

group consisting of halogen and a hydrocarbon radical, wherein said hydrocarbon radical is selected from the group consisting of C_1-C_{32} substituted or unsubstituted branched or straight chain alkyl, cycloaliphatic, aryl and heteroaryl, including five membered rings, six membered rings, and fused systems thereof; and wherein said compound comprises a label selected from the group consisting of radioisotopes, paramagnetic particles and optical particles to said sample; and

detecting an amount of the imaging agent bound to at least one of A-beta species and amyloidogenic peptides.

28. The method according to claim 27, wherein the step of applying an imaging agent comprises a compound wherein R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

29. The method according to claim 27, wherein the step of applying an imaging agent comprises a compound wherein X is oxygen, R^1 is alkyl hydroxy, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

30. The method according to claim 27, wherein the step of applying an imaging agent comprises a compound wherein X is oxygen, R^1 is an amide, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

31. The method according to claim 27, wherein the step of applying an imaging agent comprises a compound wherein X is oxygen, R^1 is urea, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

32. The method according to claim 27, wherein the step of applying an imaging agent comprises a compound wherein X is oxygen, R^1 a urethane, and R^2 is a hydrocarbon radical selected from the group consisting of structures 1a to 53a.

33. The method according to claim 27, wherein the step of applying an imaging agent comprises a compound selected from the group consisting of structures 1b to 65b.

34. The method according to claim 27, wherein the step of applying an imaging agent comprises a compound having a label that is a radioisotope selected from the group consisting of ^{3}H, ^{11}C, ^{14}C, ^{18}F, ^{32}P, ^{35}S, ^{123}I, ^{125}I, ^{131}I, ^{51}Cr, ^{36}CI, ^{57}Co, ^{59}Fe, ^{75}Se and ^{152}Eu.

35. The method according to claim 27, wherein the step of applying an imaging agent comprises a compound having a label that is a paramagnetic particle selected from the group consisting of ^{157}Gd, ^{55}Mn, ^{162}Dy, ^{52}Cr, and ^{56}Fe.

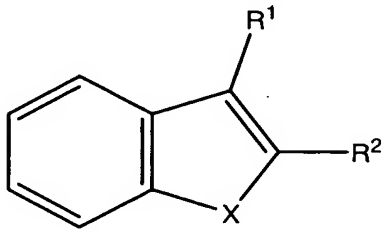
36. The method according to claim 27, wherein the step of applying an imaging agent comprises a compound having a label that is an optical particle selected from the group consisting of fluorophores and chemiluminescent entities.

37. The method according to claim 27, wherein the A-beta species is soluble A-beta selected from the group consisting of monomers, dimers, trimers, oligomers of up to 24 A-beta peptides, and combinations thereof.

38. A method as in claim 27, wherein the A-beta species is selected from the group consisting of monomers, dimers, trimers, and oligomers of A-beta 1-38, A-beta 1-39, A-beta 1-40, A-beta 1-41, A-beta 1-42, A-beta 1-43 and combinations thereof.

39. A method of assessing an amyloid -related disease comprising:

administering to a subject having or suspected of having an amyloid-related disease, an imaging agent comprising a compound having a formula



wherein X is selected from the group comprising at least one of oxygen, nitrogen and sulfur; R^1 is selected from the group consisting of substituted or unsubstituted alkyl hydroxy, amide, urea, and urethane; and R^2 is selected from the group consisting of

halogen and a hydrocarbon radical, wherein said hydrocarbon radical is selected from the group consisting of C_1-C_{32} substituted or unsubstituted branched or straight chain alkyl, cycloaliphatic, aryl and heteroaryl, including five membered rings, six membered rings, and fused systems thereof; and wherein said compound comprises a label selected from the group consisting of radioisotopes, paramagnetic particles and optical particles; and

detecting the imaging agent bound to at least one of A-beta species and amyloidogenic peptides using non-invasive imaging.

40. A method as in claim 39, wherein the soluble A-beta species is selected from the group consisting of monomers, dimers, trimers, oligomers of up to 24 A-beta peptides and combinations thereof.

41. A method as in claim 39, wherein the A-beta species is selected from the group of A-beta 1-38, A-beta 1-39, A-beta 1-40, A-beta 1-41, A-beta 1-42, A-beta 1-43 and combinations thereof.

42. A method as in claim 39, wherein the imaging agent comprises a label selected from the group consisting of radioisotopes, paramagnetic particles and optical particles.

43. A method as in claim 39, wherein the imaging agent comprises a label selected from the group consisting of ^{3}H, ^{11}C, ^{14}C, ^{18}F, ^{32}P, ^{35}S, ^{123}I, ^{125}I, ^{131}I, ^{51}Cr, ^{36}CI, ^{57}Co, ^{59}Fe, ^{75}Se and ^{152}Eu.

44. A method as in claim 39, wherein the imaging agent comprises a label selected from the group consisting of ^{157}Gd, ^{55}Mn, ^{162}Dy, ^{52}Cr, and ^{56}Fe.

45. A method as in claim 39, wherein the imaging agent comprises an optical label selected from the group consisting of fluorophores and chemiluminescent entities.

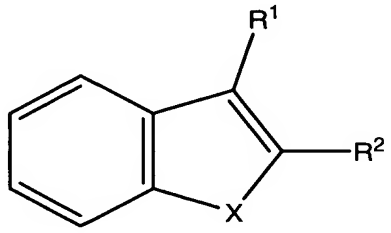
46. A method as in claim 39, wherein the amyloid-related disease is Alzheimer's disease.

47. A method as in claim 39, wherein the step of detecting comprises noninvasively measuring the level of the imaging agent within the subject .

48. A method as in claim 39, wherein the step of detecting comprises imaging the brain of the subject.

49. A method of evaluating the effectiveness of a therapy comprising:

administering to a subject a first dose of a composition comprising an imaging agent comprising a compound of a formula



wherein X is selected from the group comprising at least one of oxygen, nitrogen and sulfur; R^1 is selected from the group consisting of substituted or unsubstituted alkyl hydroxy, amide, urea, and urethane; and R^2 is selected from the group consisting of halogen and a hydrocarbon radical, wherein said hydrocarbon radical is selected from the group consisting of C_1-C_{32} substituted or unsubstituted branched or straight chain alkyl, cycloaliphatic, aryl and heteroaryl, including five membered rings, six membered rings, and fused systems thereof, and labeled for detection;

non-invasively obtaining a baseline measurement of the imaging agent within the subject;

administering to the subject a therapy to be evaluated;

administering to the subject a second dose of said composition;

non-invasively obtaining a second measurement of the imaging agent within the subject; and

comparing the two or more measurements separated in time, wherein an increase or decrease in the amount of the imaging agent present indicates the efficacy of the therapy.

50. A method as in claim 49 wherein the therapy to be evaluated is administered before administration of the first dose of the composition.

51. A method as in claim 49 wherein the first dose of the composition comprises the imaging agent in an amount ranging from 0.1 nmol to about 100 mg.

52. A method as in claim 49, wherein the imaging agent is labeled with a member selected from the group consisting of radioisotopes, paramagnetic particles and optical particles.

53. A method as in claim 49, wherein the imaging agent is labeled with a radioisotope selected from the group consisting of ^{3}H, ^{11}C, ^{14}C, ^{18}F, ^{32}P, ^{35}S, ^{123}I, ^{125}I, ^{131}I, ^{51}Cr, ^{36}CI, ^{57}Co, ^{59}Fe, ^{75}Se and ^{152}Eu.

54. A method as in claim 49, wherein the imaging agent is labeled with a paramagnetic particle selected from the group consisting of ^{157}Gd, ^{55}Mn, ^{162}Dy, ^{52}Cr, and ^{56}Fe.

55. A method as in claim 49, wherein the imaging agent comprises an optical label selected from the group consisting of fluorophores and chemiluminescent entities.

56. A method as in claim 49, wherein the steps of non-invasively obtaining measurements comprise generating and analyzing an image using a technique selected from the group consisting of positron emission tomography, magnetic resonance imaging, optical imaging, single photon emission computed tomography, ultrasound and x-ray computed tomography.

57. A method as in claim 49, wherein the step of non-invasively obtaining measurements further comprises measuring the amount of imaging agent that is activated by at least one of A-beta species and amyloidogenic peptides.